REMARKS

Reconsideration of the present application is respectfully requested.

New claims 25, 26 and 27 constitute original allowable claims 2, 5 and 10, respectively, written in independent form.

The objection to the drawing made in section no. 2 of the Official Action is not understood, because Fig. 4 depicts a groove 21 extending parallel to the longitudinal axis of the shaft 3 (see also pg. 8, lines 1-4). Clarification would be appreciated.

Paragraph no. 37 of the specification has been amended to insert numeral --165--. Also, the numeral "147" in Fig. 5b has been changed to --47--. Therefore, the objections raised in section no. 1 of the Official Action have been obviated.

Claim 1 has been amended to more clearly define the invention relative to the Carroll patent (U.S. Patent No. 5,624,214). The present invention relates to a cutting tool system in which a cutting tool is clamped within an aperture of a clamping device. In order to provide an operator with an indication that a shaft of the cutting tool is in a desired position within the clamping device, a spring-loaded element is provided in either the shaft's envelope surface or the clamping device and yieldably engages a recess formed in the other of the envelope surface and the clamping device. The spring-loaded element, (which could comprise a ball 33 biased into a recess 21 by a coil spring 31 (Fig. 7), or an elastic cap 51 (Fig. 8)), produces a sudden increase in a force necessary to displace the tool from the desired position.

Importantly, however, the spring-loaded element does not function to secure the tool within the clamping device. The actual tool-securing function is performed by clamping actuators, e.g., screws 65 in Fig. 4, which act on the clamping block to cause the clamping block to apply a tool-securing clamping force to the shaft independently of the spring-loaded element 30. Claim 1 has been

amended to recite that feature of the invention (see the last paragraph of amended claim 1).

Carroll employs a ball element 32 which is secured within a respective recess of a shaft 11 (or a shank 13) to secure the shaft (or shank) to a sleeve 12. The element is secured in the recess by a spring-loaded collet 18 which prevents the element from exiting the recess (see column 3, lines 24-28 of Carroll). Hence, in Carroll, the element 32 which engages both the sleeve 12 and the shaft 11 (or the shank 13), and which thus corresponds to the "element" of present claim 1, is never spring-biased; only the collet 18 is spring biased.

Moreover, claim 1 recites a clamping actuator which causes the clamping device to apply a clamping force "independently of the spring-loaded element" as is evident from the original disclosure. That is, one preferred actuator comprises one or more bolts 65 which function to reduce the cross-section of the shaft-receiving aperture 23 to clamp the shaft. In Carroll, the corresponding actuator would be the collet 18, but the shaft-securing force is applied through the element 32, not independently thereof as presently claimed.

Accordingly, it is submitted that claim 1 and dependent claims 2-20 distinguish patentably over Carroll.

Claim 21 has been amended to recite that the shaft has an outer envelope surface in which a plurality of longitudinally spaced recesses are formed for selectively receiving a shaft position indicator. In Carroll, the tool shaft 13 has a single annular groove 101, and in Martindell the tool shaft also has only a single annular groove. Neither of those patents discloses longitudinally spaced recesses as recited in claim 21.

Claim 22 has been amended to recite a clamping actuator arranged to act on the block independently of the spring-loaded element for reducing a cross-section of the aperture formed by the block. Claim 22 also recites that the spring-loaded element projects into the aperture for yieldably contacting the shaft. Neither Carroll

nor Martindell discloses a clamping actuator or that a spring-loaded device yieldably contacts a shaft. Martindell, like Carroll, has a spring-biased collet 60 for rendering a ball 90 non-yieldable.

In light of the foregoing, it is submitted that the application is in condition for allowance.

Respectfully submitted,

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Attachment to Amendment dated January 3, 2003
Marked Copy - Specification

Page 7, Paragraph [0033]

[0033] Fig. 4 illustrates a cutting tool and tool block according to the invention. The cutting tool 1 comprises a substantially cylindrical shaft portion 3 and a front portion 9. Said front portion carries a cutting insert 5 having at least one cutting edge 7. Alternatively, the cutting edge could be integral with, e.g., machined in, the shaft portion 3. The upper envelope surface of the shaft is equipped with a recess 21 in the form of a groove of V-shaped cross-section (see Fig. 7), which runs parallel with the longitudinal center axis of the bar. The groove has a symmetrical cross sectional form comprised of two downwardly converging side surfaces which, as seen in cross section, are of equal length. The outer diameter of the cylindrical part of the cutting tool is denoted "d". The tool block 15 features an aperture 23, which runs the entire length of the block with openings both at the front, and rear surfaces 53, 55. The diameter D of the aperture 23 is somewhat larger than the outer diameter "d" of the cutting tool. A longitudinal split 19 links the bore to one of the side surfaces 57 of the tool block along the entire length of the tool block. One or more holes extend from the upper surface 63 of an upper portion 60 of the tool block and run vertically downwards through the split 19 and into a lower part 61 of the block. The lower part of each hole is threaded to enable a clamp actuator in the form of a screw 65 to be passed downwardly through the upper part of each hole (disposed in the upper part 60 of the block 59) and screwed into the lower part 61 of the hole. The action of these screws forces the parts 60, 61 of the block together thus reducing the effective diameter "D" of the aperture, for clamping the cutting tool accommodated in said bore. Furthermore the tool-clamping device 15 features a bore 45 running vertically downwards from the upper surface of the block 63 and opening up in the aperture 23 which accommodates the bar. Said bore is located close to the front edge of the block where the upper surface 63 meets the front face 53. The center line of the bore 45 intersects the center line CL2 of the aperture 23. This bore 45 accommodates a spring-loaded device 30, which is illustrated in more

detail in Fig. 6. The groove 21 interacts with the spring-loaded device to give a slight but significant increase of the force required to rotate the cutting tool around its center longitudinal axis as it passes the point of interaction (i.e., the point where the spring-loaded device engages the recess 21). Once the correct rotational location has been thus established by "feel", the cutting tool is clamped in the damping device by tightening the screws 65.

Page 10, Paragraph [0037]

[0037] Figs. 5, 5a and 5b illustrate the invention as used in an arrangement that is especially suited for modern machine tools. In this case the clamping block comprises a sleeve 47 that has been introduced between the bar and a tool adaptor 49. The sleeve is designed to accommodate a spring-loaded device 30, as also is the adaptor in exactly the same manner as described above in connection with Fig. 4. As described previously the spring-loaded device is used only to give an indication of a required position prior to clamping the cutting tool. In this solution clamping is carried out with the help of the screws **[**65**]** 165, which lock the sleeve in position through interaction with the planar surface of a whistle notch 50 of the sleeve 47 and at the same time exert a pressure on the sleeve causing the slit 190 to narrow, hence clamping the cutting tool in the sleeve.

Attachment to Amendment dated January 3, 2003
Marked Copy: Claims 1, 2-4, 13, 15-16, 21-23 [As Amended]

1. (Amended) A cutting tool system comprising:

a clamping device including a clamping block having an aperture, the aperture including an aperture surface;

a cutting tool including a front portion at which a cutting edge is disposed, and a shaft extending rearwardly from the front portion, the shaft being fixed in the aperture by a tool-securing clamping force that is releasable to enable the shaft to be displaced relative to the clamping device to a desired position for properly orienting the cutting edge, the shaft including an outer envelope surface facing the aperture surface[, and];

a spring-loaded [device] element projecting from one of the envelope surface and the aperture surface and yieldably engaging a recess formed in the other of the envelope surface and the aperture surface when the cutting tool and its cutting edge are in the desired position, to provide an indication that the cutting tool is in such desired position by requiring a sudden increase in a force necessary to displace the cutting tool from the desired position[.] ; and

a clamp actuator arranged to act on the clamping block to cause the clamping block to apply the tool-securing clamping force to the shaft independently of the spring-loaded element which is constantly yieldable.

2. (Amended) The cutting tool system according to claim 1 wherein the shaft, when the clamping force is released, is displaceable by being rotatable about a longitudinal axis of the shaft, the spring-loaded [device] element opposing such rotation of the shaft.

Attachment to Amendment dated January 3, 2003
Marked Copy: Claims 1, 2-4, 13, 15-16, 21-23 [As Amended]

3. (Amended) The cutting tool system according to claim 1 wherein the shaft, when the clamping force is released, is displaceable along a longitudinal axis of the shaft, the spring-loaded **[**device**]** element opposing such longitudinal movement of the shaft.

4. (Amended) The cutting tool system according to claim 3 wherein the shaft, when the clamping force is released, is also displaceable by being rotatable about the longitudinal axis, the spring-loaded **[**device**]** element opposing such rotation.

13. (Amended) The cutting tool system according to claim 1 wherein the recess has a generally V-shaped cross section, the spring-loaded **[**device including**]** element comprising a rotatable element **[**engaging the recess and a spring elastically biasing the rotatable element into the recess**]**.

15. (Amended) The cutting tool system according to claim 13 wherein a spring biasing the rotatable element **[**the spring**]** comprises a coil spring.

16. (Amended) The cutting tool system according to claim 13 wherein **[**the spring comprises**]** a spring biasing the rotatable element comprises an elastomer.

21. (Amended) A cutting tool comprising a front portion at which a cutting edge is disposed, and a shaft extending rearwardly from the front portion, the shaft including an outer envelope surface having a plurality of identical recesses formed therein, the recesses spaced apart along a longitudinal axis of the shaft for selectively receiving a shaft position indicator.

Attachment to Amendment dated January 3, 2003
Marked Copy: Claims 1, 2-4, 13, 15-16, 21-23 [As Amended]

22. (Amended) A tool-clamping device comprising a block having an aperture adapted to receive and clamp a shaft of a cutting tool, a spring-loaded [device] element mounted in the block and [including a shank-contact portion] projecting into the aperture for [constantly] yieldably contacting the shaft, and a clamping actuator arranged to act on the block independently of the spring-loaded [device] element for reducing a cross section of the aperture to clamp the shaft.

23. (Amended) The tool-clamping device according to claim 22 wherein the [shank-contact portion] spring-biased element comprises a rotatable element spring-biased toward the aperture [by a spring].